

External Technical Review Summary

United States Department of Energy Office of Environmental Management (DOE-EM)

External Technical Review of Tank 48 at the Savannah River Site (SRS)

Why DOE-EM Did This Review



Tank 48 is a 1.3 million gallon tank with full secondary containment, located and interconnected within the SRS

tank system that will play a very important role in removal and processing of high-level waste (HLW) in the years ahead. However, the tank is currently isolated from the system and unavailable for use, because its contents. It contains approximately 250,000 gallons of salt solution containing Cesium-137 and other radioisotopes which are contaminated with significant quantities of tetraphenylborate (TPB), a material which can release benzene vapor to the tank head space in potentially flammable concentrations. Plans for SRS HLW processing require removal and disposition of the contents of Tank 48 and its return to service. *The external review objective was to assess the technical viability of the current Washington Savannah River Company (WSRC) path forward for the removal, treatment and disposition of Tank 48 contents.*

What the ETR Team Recommended

The ETR Team recommends the following to improve the probability of timely success:

- Commit to Steam Reforming as the lead TPB processing approach immediately and carry Wet Air Oxidation (WAO) as a back up, to be developed to a point of assuring viability.
- Embark on a high priority heel management project, including development, testing and planning for tank flushing and the establishment of end point criteria for Tank 48 cleanliness..

- Incorporate process steps to improve schedule success (January 2010). Evaluate pre-concentration (e.g. filtration) to reduce the volume to be treated followed by transferring the bulk of the tank contents to another tank (existing or smaller constructed tank) to allow parallel heel processing and flushing. The team believes that these steps will greatly improve the probability of schedule success.
- Continue the development of steam reforming on the earliest practical schedule.

What the ETR Team Found

The ETR Team's over-arching conclusion was that while TPB processing alternatives are being properly and thoroughly evaluated, the issues necessary to achieve *timely* Tank 48 return-to-service have not been fully addressed. In the Team's view, the critical considerations for selection of a primary treatment technology include the (1) ability to produce a treated material compatible with subsequent vitrification at the Defense Waste Processing Facility (DWPF), (2) ability for the necessary process components to physically fit within the space envelope of the 241-96H facility (to avoid construction of a new radiation compliant building), and (3) process maturity to facilitate expeditious testing, design, construction and operation that is consistent to the extent possible with overall SRS schedule constraints. The two TPB processing methods chosen by WSRC as lead candidates (Steam Reforming and WAO) are technically sound, likely viable methods, and offer the best prospects for success among the approximately 80 alternatives considered. However, several areas were identified where the previous evaluations have not been sufficiently complete. Removal of residual material, tank cleanup after removal of the bulk of the material, and understanding of the form, quantities, concentrations and implications of TPB processing by-products are topics which will be very important to success.

To view the full ETR reports, please visit this web site:
<http://www.em.doe.gov/Pages/ExternalTechReviews.aspx>

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The purpose of an External Technical Review (ETR) is to reduce technical risk and uncertainty. ETRs provide pertinent information for DOE-EM to assess technical risk associated with projects and develop strategies for reducing the technical risk and to provide technical information needed to support critical project decisions. Technical risk reduction increases the probability of successful implementation of technical scope. In general, ETRs assesses technical bases, technology development, and technical risk identification and handling strategies.



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